Public Health
Seattle & King County
HEALTHY PEOPLE. HEALTHY COMMUNITIES.
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PUBLIC HEALTH-SEATTLE & KING COUNTY
MEASLES (RUBEOLA) PREVENTION AND CONTROL
RECOMMENDATIONS FOR HEALTH CARE PROVIDERS AND FACILITIES
April, 2004

LABORATORY CONFIRMATION OF MEASLES

Laboratory confirmation of suspected measles cases is essential. Since laboratory results may not be available for several days to several weeks, but prophylaxis of susceptible contacts has to occur within 6 days of exposure, outbreak control activity has to proceed while laboratory tests are processed.

Whenever laboratory specimens to confirm measles are collected, please call Public Health at 206-296-4774 to report a suspect measles case. We will expedite testing through our laboratory, or the Washington State Department of Health laboratory. Often same, or next day results are available, and there is no charge to the patient.

Serology

Draw at least 4-5 ml blood (8-10 ml is best) in a red or tiger top tube (tubes without anticoagulants or preservatives). **Please notify your laboratory that the serologic specimens MUST go to the Public Health Laboratory for testing. The test results may be delayed or inaccurate if the specimen is sent to a private laboratory.** The state laboratory routinely performs rubella IgM and IgG testing on all specimens submitted for measles testing.

Measles IgM: This antibody test measures IgM antibody, an indicator of acute infection. For the best results, draw samples for measles IgM testing 3 or more days after rash onset. Serologic specimens can be drawn sooner than this as 70-85% of true measles cases will demonstrate IgM antibody by the day of rash onset. However, *if the test result is negative, the patient should know that another specimen may be required*. By the third day after rash onset, 99% of true measles cases will demonstrate IgM antibody.

Measles IgG: Both acute and convalescent sera are necessary to determine whether there has been a four-fold or greater rise in total measles antibody. Draw the first sample during the acute illness and the second (convalescent specimen) 2 to 3 weeks later. The laboratory should determine the antibody results of both specimens in the same laboratory run.

Viral Culture

Viral isolation by culture can help us understand the origin of the virus and relatedness of measles cases. If possible, please collect the following specimens in addition to the blood for serology:

Nasal wash: Use 3 to 5 mls of sterile non-bacteriostatic saline and a bulb aspirator or syringe to rinse the nasal passage. Place all of the recovered wash solution in a tube of viral transport medium. Nasal wash must be collected as soon as possible, and within one week after rash onset.

Urine - This is the preferred viral culture technique. Collect 50 to 100 ml of clean voided urine in a sterile container. Urine must be collected as soon as possible and no later than one week after rash onset.

Blood - Collect 5 to 10 ml of blood in a heparinized tube. Please note that heparinized tubes are used for culture while measles antibody tests require the use of tubes that do not contain anticoagulants.

Laboratory Tests to Rule Out Other Causes

It is also valuable to conduct laboratory tests appropriate to rule out other potential causes. An example would be a throat culture to look for evidence of streptococcal infection.

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MEASLES IMMUNIZATION

Routine Measles, Mumps and Rubella (MMR) Immunization Recommendations:

- All children ages 12 to 15 months and older, and adults born in or after 1957, should be immunized against measles.
- Two doses of vaccine are recommended: the first at age 12 to 15 months and the second at entry to kindergarten or 6th grade (depending on year of birth). The second dose can be given as early as 28 days after administration of the first dose.
- Older children and college entrants who have had only one dose of MMR should be given a second dose. (The minimum interval between doses is 28 days.)
- Immunizations given before the first birthday or before 1968 should not be counted as valid and should be repeated.
- Children between 12 months and 5 years of age without documentation of prior MMR who present to medical facilities for any reason should be immunized. In previous measles outbreaks, many children with measles had missed opportunities for immunization at prior office visits.

Contraindications to Receipt of MMR Vaccination

The only valid contraindications to MMR are:

- Moderate to severe acute illness (this is a precaution and vaccination may be considered during an outbreak).
- Persons who have experienced a severe allergic reaction (i.e., hives, swelling of mouth or throat, difficulty breathing, low blood pressure, shock) following a prior dose of measles vaccine or vaccine component (e.g., gelatin, neomycin).
- Pregnant women.
- Recent receipt of immune globulin or other blood products
- Significant immunosuppression

Note: Egg allergy is not a contraindication to MMR vaccination

Preventing Transmission of Measles in Healthcare Facilities

Contact between other patients and HCW and suspected measles cases should be minimized. Medical facilities should promptly screen walk-in patients for fever and rash. Every effort should be made to rapidly isolate persons with suspected measles. Airborne infection isolation rooms are recommended, when available.

Other options include having the patient stay in the car for the evaluation, using a separate entrance or room, and having the patient wear a surgical or procedure mask when going to the lab, etc. Note that airborne transmission via aerosolized droplet nuclei has been documented in closed areas (e.g., exam rooms) for up to 2 hours after a person with measles occupied the area.

Recommendations for Managing Measles Exposures in Healthcare Facilities:

- Identify susceptible patients, staff, and visitors exposed to the case. Cases are infectious up to 5 days before through 4 days after rash onset.
- Measures to prevent infection spread cannot wait for lab results but should be undertaken based on clinical diagnosis.
- Potential exposures: those who were in the same room as a case, or within 2 hours of the room being last occupied by the case.
- Health care workers who should be presumed susceptible to measles:
  - ✓ Health care workers born in or after 1957, without one of the following: documented evidence of receiving two doses of valid measles vaccine, documented evidence of seroimmunity, or documented history of physician diagnosed measles.
  - ✓ Health care workers born before 1957 without one of the following: documented evidence of receiving one dose of valid measles vaccine, documented evidence of seroimmunity, or documented history of physician diagnosed measles.
- Patients and Staff who should be presumed susceptible to measles:
  - ✓ Patients and visitors older than 1 year of age, born in 1957 or later who do not have one of the following: documented evidence of receiving at least one dose of valid measles vaccine, documented evidence of seroimmunity (measles IgG positive), or documented history of physician diagnosed measles disease.
  - ✓ Infants less than 1 year of age.

Note: measles vaccine given before one year of age or before 1968 should not be counted as valid doses.

Immunoprophylaxis of exposed susceptible contacts

Measles vaccine given within 3 days after first exposure is sometimes successful in preventing infection. Immune globulin (IG) is effective in preventing or modifying illness if given within 6 days after first exposure. Protection lasts up to 5 months. IG is recommended primarily for the following exposed persons:

- Infants under 1 year of age without previous measles vaccination
- Susceptible pregnant women
- Immunocompromised persons

Dosage of IG:

- 0.25ml/kg (0.11 ml/lb) of body weight, IM. Maximum dose=15 ml.
- Immunocompromised persons: 0.5 ml/kg (0.22 ml/lb) of body weight. Maximum dose=15 ml.
- MMR should be given 5 or more months later (when passively acquired antibodies should have disappeared) to confer long term protection.
- See the following table for guidelines on injection volume of IG:

Injection Volume Table			
Intramuscular	**Needle Sizes ***	**Volume Injected (ml)**	
		Average	**Range**
Gluteus medius	20-23 gauge x 1 ½ to 3 inches	2-4	1-5
Gluteus minimus	20-23 gauge x 1 ½ to 3 inches	1-4	1-5
Vastus lateralis	22-25 gauge x 5/8 to 1 inch	1-4	1-5
Deltoid	23-25 gauge x 5/8 to 1 inch	0.5	0.5-2
* You should check with the manufacturer about what needle gauge and length they recommend for immune globulin. As you know, for adults >18 years, we recommend 22-25 gauge x 1-1 ½ inch needles for vaccines (the needle size for immune globulins aren't specified).			

- Notify all exposed persons (even if immunized or given IG) that they may develop measles within the next 3 weeks and to be alert for onset of prodromal symptoms and febrile illness. Administration of IG may prolong the incubation period and attenuate the clinical illness.

- If an exposed person develops prodromal symptoms (fever, cough, coryza, photophobia, conjunctivitis), they should isolate themselves and contact their employer and Public Health immediately. If they need medical attention, they should call ahead to alert medical staff so as to avoid exposing other patients.

Exposed staff:

- If a specimen drawn within 6 days after exposure is positive for measles IgG, or total antibody, consider the person immune.
- If the HCW has had 1 dose of measles vaccine given in 1968 or later and after the first birthday, give an additional dose of vaccine. If the 2nd vaccine dose can be given within 72 hours of exposure, consider the person immune. If vaccine cannot be administered within 72 hours, send measles serology, and consider the person immune if the test shows antibody.
- If a staff member has had 2 documented doses of measles vaccine given after 1968 and after the first birthday, consider the staff person immune.
- Whenever possible, exposed susceptible HCW should be relieved of direct patient contact from the 6th to the 20th day after exposure, even if they were given vaccine or IG after exposure. If not possible, staff should have their temperatures taken and be asked about prodromal symptoms as they come to work from days 6 through 21 after exposure, and should immediately be sent home if temperature is over 99.6^{O}F or prodromal symptoms are present.

- HCW who develop measles should avoid patient contact until at least 4 full days after rash onset. **This screening procedure must be followed rigorously to prevent staff members with prodromal phase measles from infecting others.**
- During community-wide outbreaks, consider triage upon arrival at medical facilities to identify and separate possible measles cases from other patients. Signs should be posted at the door advising possible cases not to enter without special arrangements being made. When isolation measures are impossible, consider disposable face masks for the patients with possible measles.
- If admitted, patients should remain in respiratory isolation until at least the end of the fourth day after rash onset.
- Imunocompromised patients should be in isolation for the duration of their illness.

Report known and suspected measles cases immediately to Public Health at 206-296-4774 (in King County) or to your local health jurisdiction if outside of King County.